

REMARKS

The Examiner rejected Claims 4-5 and 12-13 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject-matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. In particular, the Examiner pointed to a lack of clarity with respect to the signals generated by the "input signal converter".

The above amendments to the claims clarify the signals generated by, or input to, the signal converter. Applicant submits that these amended claims meet the requirements of 35 U.S.C. 112, first and second paragraph. With respect to the first paragraph, the Examiner's attention is directed to Figures 4 and 5 of the present application and the explanation thereof.

The Examiner rejected Claim 1 under 35 U.S.C. 102(b) as being anticipated by Adler, *et al* (hereafter "Adler") (Eliminate Signal Noise with Discrete Wavelet Transformation; Electronic Design, Design Application; September 5, 2000; pages 1-15. www.elecdesign.com/Articles/ArticleID/4695/4695.html). Applicant traverses this rejection. The Examiner has the burden of showing by reference to the cited art each claim limitation in the reference. Anticipation under 35 U.S.C. 102 requires that each element of the claim in issue be found either expressly or inherently in a single prior art reference. In *re* King, 231 USPQ 136, 138 (Fed. Cir. 1986); *Kalman v. Kimberly-Clark Corp.*, 218 USPQ 781, 789 (Fed. Cir. 1983). The mere fact that a certain thing may result from a given set of circumstances is not sufficient to sustain a rejection for anticipation. *Ex parte Skinner*, 2 USPQ2d 1788, 1789 (BdPatApp&Int 1986). "When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference" (*In re Rijckaert*, 28 USPQ2d, 1955, 1957).

While Adler teaches a thresholding method for de-noising a signal, the method is different from the present invention as claimed in Claim 1. In particular, Adler teaches that all of the component signals are thresholded to produce processed component signals and then the processed component signals are recombined (see Figure 6) to provide the output signal. Hence, the synthesizer taught in Adler generates the filtered signal from the processed low-frequency component signal and the processed high-frequency component signal. In

contrast, Claim 1 requires that the filtered signal be generated from the low-frequency component signal and the processed high-frequency component signal. Accordingly, Applicant submits that the present invention as claimed in Claim 1 is not anticipated by Adler.

The Examiner rejected Claim 2 under 35 U.S.C. 103(a) as being unpatentable over Adler in view of Shark, *et al* (hereafter "Shark") (Wavelet-Like Filter Banks: Design and Some Application Results; Signal Processing Proceedings, 2000 WCCC-ICSP 2000. 5th International Conference on Vol. 1 21-25 Aug. 2000 pages 315-320). Applicant traverses this rejection.

To sustain a rejection under 35 U.S.C. 103, the Examiner must show that the combined references teach each of the elements of the claim or that there is some motivation in the art for altering one of the teachings to arrive at the combined set of teachings. "The mere fact that a reference could be modified to produce the patented invention would not make the modification obvious unless it is suggested by the prior art." (*Libbey-Owens-Ford v. BOC Group*, 4 USPQ 2d 1097, 1103). In addition, the Examiner must show that there is some motivation in the art that would cause someone of ordinary skill to combine the references, and that in making the combination, there was a reasonable expectation of success. Where the claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under section 103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success... Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. *In re Vaeck*, 20 USPQ2d 1438, 1442(CAFC 1991).

Basically, the Examiner argues that Adler teaches all of the limitations of Claim 2 with the exception of the limitation requiring the analyzer to be a plurality of finite impulse response filters. The Examiner looks to Shark for the missing teaching.

As noted above, Adler does not teach all of the limitations of Claim 1. In particular, Adler does not teach a synthesizer that meets the limitations of the claim. The Examiner has not pointed to any teaching in Shark that would overcome this problem or cause someone of ordinary skill to modify the teachings of Adler. Hence, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claim 2.

The Examiner rejected Claims 3, 6-7, 9 11 and 14 under 35 U.S.C. 103(a) as being unpatentable over Adler in view of Taswell (The What, How, and Why of Wavelet Shrinkage Denoising; Computing in Science and Engineering; Vol. 2, No. 3, May/June 2000, page 12-19). Applicant traverses this rejection.

With respect to Claim 3, the Examiner argues that Adler teaches all of the limitations of Claim 3 except for the limitation requiring the input signal to be created by a signal converter from a measured signal through a mathematical transformation and then applying an inverse mathematical transformation to the filtered signal to generate an output signal. The Examiner looks to Taswell as providing the missing teaching.

First, as noted above, Adler does not teach the limitations of Claim 1 from which Claim 3 depends. The Examiner has not pointed to any teaching in Taswell that provides the missing teachings. In fact, Taswell teaches a denoising scheme which uses the same universal thresholding procedure as Adler.

Second, the Examiner argues that Taswell discloses that the input signal to the thresholding algorithm is a measured signal and that the wavelet transform is a mathematical transform. As best Applicant can understand the Examiner's argument, the Examiner appears to be arguing that the analyzer is the signal converter and the synthesizer is the inverse converter. However, if one makes that assignment, then there are no elements to satisfy the limitations with respect to the analyzer and synthesizer. Hence, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claim 3, and the claims dependent therefrom.

With respect to Claim 6, the Examiner argues that Taswell teaches that the threshold value depends on the amplitude of the low-frequency component signal. The Examiner looks

to the section entitled "Variations on a Theme" as supporting this assertion. Applicant must disagree with the Examiner's reading of Taswell. The section in question states that the threshold value can depend on the input data, i.e., the input signal, not the low-frequency component signal. Hence there are additional grounds for allowing Claim 6.

With respect to Claim 14, the Examiner makes the same argument that the Examiner made with respect to Claim 6. It should be noted that Claim 9, from which Claim 14 depends also requires the same synthesizer as Claim 1, and hence is not taught in Adler or Taswell. In addition, the same argument applies to the limitation that the threshold value depends on the amplitude of the low-frequency component signal. Accordingly, there are additional grounds for allowing Claim 14.

With respect to Claims 7, 9, and 11, the Examiner argues that Adler discloses a filter having first and second thresholding filters as claimed but that Adler does not teach the input signal converter limitation of the claims. The Examiner looks to Taswell as teaching an input signal converter. The Examiner argues that one would be motivated to combine the teachings to arrive at the present invention as claimed in these claims because it would further separate the transformed signal into components. The Examiner does not point any reason why one would want to further separate the transformed signal into components. Applicant must disagree with the Examiner's reading of both of these references.

With respect to Claims 7 and 9, Applicant again notes that the filter of Adler does not satisfy the synthesizer limitations of the claims, since the Adler synthesizer operates on processed low-frequency component and processed high-frequency component signals. In addition, the Examiner's argument that the multi-level decomposition shown in Adler satisfies the limitation of the first and second thresholding filters is likewise flawed. The embodiments taught in Adler in the cited passages and figures do not utilize multiple thresholding filters operating in series. Furthermore, Applicant repeats the arguments made above with respect to the teachings of Taswell. Finally, the Examiner has not pointed to any teaching as to why one would modify the teachings of the references to provide the components connected in the claimed order. Hence, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claims 7 and 9, or the claims dependent therefrom.

With respect to Claim 11, the Examiner has not pointed to any teaching that would cause one of ordinary skill to add the second converter and the second inverse converter at the claimed location in the filter. Hence, there are additional grounds for allowing Claim 11.

The Examiner rejected Claims 4-5, 8, and 12-13 under 35 U.S.C. 103(a) as being unpatentable over Adler in view of Taswell in further view of Applicant Admitted Prior Art (AAPA). Applicant traverses this rejection and repeats the arguments made above with respect to the lack of teachings in the combination of Adler and Taswell with respect to Claims 3 and 11 from which Claims 4 and 5 and Claims 12 and 13, respectively depend. The AAPA does not provide the missing teachings.

With respect to Claims 4 and 12, the Examiner argues that Adler and Taswell teach all of the limitations of these claims except for the limitation that the signal converter generate a signal determined by the logarithm or the square of the signal that is input to the signal converter. The Examiner maintains that the passages in the "Background of the Invention" teach an input converter having an amplitude determined by the logarithm of the input signal. The Examiner maintains that one of ordinary skill would be motivated to include such a signal converter in the device taught by Adler, as modified by the Examiner's selected teachings from Taswell, because it would provide a more useful display of the signals.

First, as noted above, the combined teachings of Adler and Taswell do not satisfy the limitations of the underlying claims.

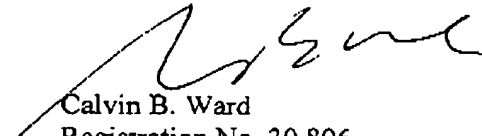
Second, the prior art passage identified by the Examiner teaches that some prior art video display systems that utilize a denoising system display the logarithm of the final filtered signal on the video screen. Hence, the combination of the teachings identified by the Examiner would lead to a system in which the logarithm of the final filtered signal is generated; however, the inverse logarithm is not applied to arrive at a final filtered signal. This is not the present invention as claimed in these claims. Hence, Applicant submits that the Examiner has not made a *prima facie* case for obviousness with respect to Claims 4 and 12.

With respect to Claims 5 and 13, the Examiner argues that the choice of mathematical function used to process the input signal is not critical, and hence, the above combination of teachings also extends to the case in which the logarithm function is replaced by the square function. First, Applicant repeats the arguments made above with respect to non-obviousness of the logarithm claims. Second, as noted in the specification, filtering the logarithm of the signal provides advantages in reducing trace noise; while the square function is useful in filtering signals that are dominated by a noise floor. Hence, the choice of function is not merely a matter of design choice. Accordingly, there are additional grounds for allowing Claims 5 and 13.

The Examiner rejected Claim 10 under 35 U.S.C. 103(a) as being unpatentable over Adler in view of Taswell in further view of Shark. Applicant traverses this rejection and repeats the arguments made above with respect to the rejection of Claim 9 from which Claim 10 depends.

I hereby certify that this paper is being sent by FAX to 517-273-8300.

Respectfully Submitted,



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